

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos.: 50-528/87-29, 50-529/87-29, 50-530/87-30

Docket Nos.: 50-528, 50-529, and 50-530

License Nos.: NPF-41, NPF-51, and NPF-65

Licensee: Arizona Nuclear Power Project  
P. O. Box 52034  
Phoenix, Arizona 85072-2034

Facility Name: Palo Verde Nuclear Generating Station - Units 1, 2, and 3

Inspection at: Palo Verde Site, Wintersburg, Arizona

Inspection Conducted: August 17-21, 1987

Inspectors:

RP Sorensen  
R. C. Sorensen, Reactor Inspector

9/9/87  
Date Signed

Phillip Qualls  
P. Qualls, Reactor Inspector

9/9/87  
Date Signed

Approved by:

S. A. Richards  
S. A. Richards, Chief  
Engineering Section

9/9/87  
Date Signed

Summary:

Inspection on August 17-21, 1987 (Report Nos. 50-528/87-29, 50-529/87-29, and 50-530/87-30)

Areas Inspected: Unannounced inspection and followup by regional based inspectors of Inspector Identified Items, TMI Action Plan Items, Part 21 Reports, Generic Letters and Licensee Event Reports (LERs). NRC Inspection Procedures 25565, 92700, 30703, 92701, and 92703 were covered during this inspection.

Results: Of the areas inspected, no violations or deviations were identified.



## DETAILS

### 1. Persons Contacted

#### Arizona Nuclear Power Project

- \*E. E. Van Brunt, Jr., Executive Vice President
- \*W. E. Ide, Director, Corporate QA/QC
- \*J. R. Bynum, PVNGS Plant Manager
- \*T. D. Shriver, Compliance Manager
- \*R. R. Baron, Compliance Supervisor
- \*D. N. Stover, Nuclear Safety Supervisor

The inspectors also talked with numerous other licensee personnel during the course of the inspection.

\*Denotes those individuals attending exit meeting of August 21, 1987.

### 2. Followup of Inspector Identified Items

#### Unit 1

- a. (Closed) Followup Item 50-528/86-24-01: Evaluate Wrong Size Fuse in Plant Protection System (PPS) Shutdown Matrix

While performing routine surveillance on the PPS, Instrumentation and Control (I&C) technicians discovered that some isolation fuses between PPS channels "A" and "B" were blown. A complete check of all the isolation fuses revealed that, in Unit 1, five fuses were blown, one was missing and two were the wrong size. A check of Unit 2 fuses revealed that four fuses were blown.

The inspector had left this issue open pending evaluation into the potential effects of having a wrong size fuse installed in the circuitry, as well as the licensee's actions to identify similar fuse problems in the future.

In a memo to the licensee's compliance organization, dated August 15, 1986, I&C operations engineers stated that missing or overrated fuses in the PPS would not compromise the PPS in an unconservative manner. Also, I&C maintenance management issued an I&C Quality Improvement Report which informed I&C personnel of occurrences where incorrect fuses were installed in the PPS. It also established policy in using reference documents to verify proper fuse rating rather than replacing fuses like for like. A training session was held also on this subject matter. The inspector reviewed the attendance lists for these training sessions. All bistable relay crossover fuses in Units 1 and 2 were checked for correct amperage.

This item is closed.



b. (Closed) 50-528/87-12-01: Emergency Operating Procedure/Generic Technical Guidelines Deviations

As discussed in paragraph 2 of inspection report 50-528/87-12, the licensee did not have available justification for the deviations from the CEN-152, Revision 2, guidelines that were incorporated into the plant specific Emergency Operating Procedures (EOPs). To determine if any deviations were of safety significance, the inspector selected the EOP for the Small Break LOCA (41RO-1ZZ08) and asked the licensee to provide justification for the six most significant deviations of the twelve identified in that procedure during the inspection. In most cases, the deviations were items that were contained in the EOP but were not readily apparent to a reviewer not familiar with the facility. In the remaining cases, the deviations were necessary based on differences between Palo Verde and the generic Combustion Engineering (CE) plant design. In this sample, no cases of any deviations of safety significance were identified. Based on the review of this sample and the licensee's willingness to revise their EOPs when CEN-152, Revision 3, is approved and to use the Standard Review Plan for guidance, this item is closed.

c. (Closed) Followup Item 50-528/86-16-02: BOP ESFAS Module Prior History Records

Plant technicians discovered a broken wire in the loss of power/load shed module of the "A" train BOP ESFAS cabinet in Unit 2. This broken wire would have prevented the closure of the Emergency Diesel Generator breaker in the event of a loss of normal power to the bus.

From their review of the connector failure and history of prior failures, the inspection team had made the following observations to licensee management:

- ° Maintenance records did not provide sufficient information to determine the significance of prior wire failures.
- ° Maintenance records did not provide specific information on the mechanism or location of prior failures.
- ° The number and apparent similarity of wire failures over the previous year strongly suggested the need to further evaluate the generic significance of the failures.

The licensee responded to these observations by improving the information contained in work orders, which are the primary maintenance records at Palo Verde. This was accomplished by revision to the Work Control procedure, 30AC-9ZZ01. Also, procedure 73AC-0ZZ37, "Root Cause of Failure," has been revised to more closely tie work requests generated as a result of equipment failures to the performance of root cause analyses. Also, per this procedure, a root cause analysis is now performed whenever equipment has a history of two or more identical failures. Root cause of failure analyses would lead to evaluation of generic implications. Finally, the Maintenance Manager issued a Maintenance Department



Quality Improvement Report, #87-01, to emphasize to maintenance personnel the need for completeness in describing work performed and observations made during work activities. A training session was also held with maintenance personnel with regard to this subject matter.

This item is closed.

- d. (Closed) Unresolved Item 50-528/86-09-03: Procedure for Temporary Hose in Local Leak Rate Test Did Not Require Removal of Temporary Hose

The inspector had noted that a particular work order had installed a temporary hose connecting the demineralized water header to the drain line between the pressurizer liquid sample line containment isolation valves. The demineralized water was being used to flush one of the valves following an unsuccessful local leak rate test. The work order did not include restoration steps for removal of the temporary hose. This item was left open to review other work orders for proper equipment restoration steps following maintenance activities.

The inspector reviewed nine other work orders which performed similar types of temporary equipment installation. All of them either included steps to remove the temporary equipment directly or referenced other work orders which ensured the equipment removal.

Therefore, based on this sample, the inspector concluded that a programmatic problem with temporary equipment installation and removal does not appear to exist. This appeared to be an isolated case.

This item is closed.

## Unit 2

- a. (Closed) Followup Item 50-529/86-33-03: Lack of Formal Method in EER Program to Transfer Responsibility for Corrective Action Implementation

The inspector had originally identified the lack of a formal method in the Engineering Evaluation Request (EER) program to transfer the responsibility for implementing corrective actions for EERs.

The licensee has revised procedure 73AC-0ZZ29, Engineering Evaluation Request, to ensure that copies of closed EERs, with final disposition documented by the System Engineer, are transmitted to the managers of the affected organizations. These managers are then responsible to ensure the actions directed by the EER are carried out. This appeared to be a more controlled method of ensuring actions mandated by an EER resolution are completed.

This item is closed.

b. (Closed) Followup Item 50-529/86-33-05 - Review of System Engineer Program and Develop Functional Job Description

The inspector had originally noted that no functional job description existed for system engineers. The licensee committed to reviewing the system engineer program and developing functional job descriptions that include the engineer's responsibilities.

Operations Engineering Department Guideline - 034, issued June 22, 1987, described the system engineer's responsibilities. The inspector found their responsibilities to be extensive and appropriate.

This item is closed.

Unit 3

The inspector followed up the two specific open items documented in the allegation board meeting memorandum dated February 21, 1986, associated with allegation RV-85-A-058.

a. (Closed) 86-01-GH: Transformer Silver Plating Peeling Off

A concern had been received by Region V that silver plating was peeling off of the transformers.

Silver plating is on individual connections or lug-type terminations in transformers, or on bus bars, and is used to enhance conductivity. The inspector could not personally inspect any transformers or bus bars as these are high voltage electrical equipment and were energized during the time of the inspection.

Therefore, the inspector inquired of the licensee as to whether the peeling or flaking of silver plating had ever been identified as a problem before. Licensee representatives stated no. Also, licensee representatives in the licensee's Quality Investigations organization stated that they had not received any concerns in this specific area, based on records extending back through 1984.

Therefore, due to the lack of specific information, and the lack of evidence of a problem in this area, this item is considered closed.

b. (Closed) 86-02-GH: Cable Conduit Bend Radius Specification Exceeded

A concern had been received by Region V that minimum bend radius specifications were being exceeded.

The inspector measured the bend radius of a sample of Class IE power cables in Unit 3. None were found with a bend radius less than the minimum required by Specification 13-EM-301.

The licensee was cited for violating minimum bend radius specifications previously in Inspection Report 50-529/84-04. The

licensee implemented extensive corrective actions at that time which the inspector verified. (See Inspection Report 50-529/85-10.)

Therefore, this concern is considered resolved and this item is closed.

### 3. TMI Action Plan Items

#### a. (Closed) I.D.2 - Safety Parameter Display System

This item involved the development and implementation of a Safety Parameter Display System (SPDS). Per NUREG-0737, this system should display to operating personnel a minimum set of parameters which define the safety status of the plant.

At Palo Verde, this development and implementation of an SPDS was included as a license condition for Units 1 and 2. However, this license condition stipulated that the SPDS was not to be used until NRR had audited the system and authorized its use. The licensee did develop and install an SPDS. NRR conducted an audit of the Palo Verde SPDS on November 18 and 19, 1986. The SPDS was found acceptable for use for accident evaluation. By letter dated February 5, 1987, NRR lifted the restriction on the use of the SPDS as specified in the above-mentioned license condition.

Therefore, this item is closed for all three units.

#### b. (Closed) II.K.3.5 - Auto Trip of Reactor Coolant Pumps (RCPs) (Unit 3)

The inspector had reviewed the licensee's implementation of this TMI Action Plan Item in a previous inspection report (see inspection report 50-530/87-27). The inspector had confirmed that the licensee had included the trip two/leave two RCP strategy of CEN-268, "Justification of the Trip Two/Leave Two RCP Strategy During Transients." However, not all of the guidelines of CEN-268 appeared to have been followed.

Guidance is given by CEN-268 to trip two RCPs when a certain low pressure setpoint is reached during a transient. This low pressure setpoint is plant specific, and Palo Verde has chosen the Safety Injection Actuation Signal (SIAS) setpoint of 1837 psia. When Reactor Coolant System (RCS) subcooling is lost, coincident with either a containment radiation alarm or the lack of a steamline radiation alarm (which would indicate a LOCA event), the other two RCPs are to be tripped per CEN-268. This helps the operators distinguish between a LOCA event, in which all RCPs should be tripped due to excessive RCS inventory loss, and a Steam Generator Tube Rupture, in which it is helpful for two RCPs to remain running to help with plant pressure control. However, at Palo Verde, upon a loss of RCS subcooling, all RCPs are tripped without regard to containment or steamline radiation alarms. This is because the RCP impellers and diffusers are subject to damage during saturated conditions. This was demonstrated during the first Hot Functional

Test in Unit 1 when the RCPs were run near saturated conditions and damage was sustained by the pump impellers and diffusers. Therefore, to preclude damaging the RCPs, they are all tripped whenever subcooling is lost. This is acceptable since, per CEN-152, Revision 2, tripping all RCPs for any Design Basis Event still yields acceptable results.

The inspector found the licensee's implementation of this item to be acceptable and it is closed.

4. Followup of Generic Letters

(Closed) Generic Letter 86-06: Implementation of TMI Item II.K.3.5

This generic letter required the licensee to submit certain information concerning RCP trip strategy and implementation of TMI Action Plan Item II.K.3.5 for plant specific reviews.

The inspector verified that the licensee provided this information to NRR per letter No. ANPP 39138, dated November 24, 1986. Further, the inspector verified that procedures identified by the licensee as requiring RCP trip guidelines have had the trip two/leave two RCP strategy incorporated. In addition, these procedures use the instrumentation identified by the licensee in their response to this generic letter to determine RCP trip setpoints.

This generic letter is closed for all three units.

5. Followup of Part 21 Reports

(Closed) Part 21 86-22-P: Failure of Wilmar Electronics Underpower Relays to Meet QA Standards Required for Nuclear Power Plants

This Part 21 report involved the discovery of several discrepancies in Wilmar Electronics RCP underpower relays. The discrepancies included such things as overheated components, damaged circuit boards, bad solder connections, and circuit boards that did not match the vendor supplied schematic drawings.

The licensee's Quality Procurement Department conducted a computer search of the Material Management Information System (MMIS) Manufacturer Part Number List. This search, coupled with additional research by Procurement Engineering, determined that these components have not been supplied to PVNGS. This is documented in ANPP memorandum No. 026-00197 dated April 3, 1987.

This item is closed for all three units.

6. Licensee Event Reports (LERs)

The following LER was reviewed and closed. The inspector verified that reporting requirements had been met, root causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, and the LER forms were complete.

LER 2-87-12, L1 - Late Containment Airlock Leakage Surveillance -  
Test Due to an Error in a Procedure

7. Exit Meeting

The inspector met with the licensee representatives denoted in paragraph 1 on August 21, 1987. The scope of the inspection and the inspector's findings as noted in this report were discussed.

←

